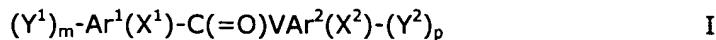


CLAIMS

1. A compound of the general formula I



wherein

5 V designates $-\text{CH}_2\text{-CH}_2-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$;

Ar^1 and Ar^2 independently are selected from aryl and heteroaryl;

m is an integer selected from the group consisting of 0, 1, and 2,

p is an integer selected from the group consisting of 0, 1, and 2,

wherein the sum of m and p is at least 1;

10 each Y^1 and Y^2 independently represents a substituent selected from A, B, and C

$-\text{Z-N}^+(\text{R}^1)(\text{R}^2)\text{R}^4\text{Q}^-$, (A)

$-\text{NR}^3\text{-Z-N}^+(\text{R}^1)(\text{R}^2)\text{R}^4\text{Q}^-$, and (B)

$-\text{O-Z-N}^+(\text{R}^1)(\text{R}^2)\text{R}^4\text{Q}^-$; (C)

wherein Z is a biradical $-(\text{C}(\text{R}^H)_2)_n-$, wherein n is an integer in the range of 1-6 and each R^H is

15 independently selected from hydrogen and $\text{C}_{1-6}\text{-alkyl}$, or wherein $(\text{R}^H)_2$ is $=\text{O}$;

R^1 , R^2 and R^4 independently are selected from optionally substituted $\text{C}_{1-12}\text{-alkyl}$, optionally substituted $\text{C}_{2-12}\text{-alkenyl}$, optionally substituted $\text{C}_{4-12}\text{-alkadienyl}$, optionally substituted $\text{C}_{6-12}\text{-alkatrienyl}$, optionally substituted $\text{C}_{2-12}\text{-alkynyl}$, optionally substituted $\text{C}_{1-12}\text{-alkoxycarbonyl}$, optionally substituted $\text{C}_{1-12}\text{-alkylcarbonyl}$, optionally substituted aryl, optionally substituted

20 aryloxycarbonyl, optionally substituted arylcarbonyl, optionally substituted heteroaryl, optionally substituted heteroaryloxycarbonyl, optionally substituted heteroarylcarbonyl, aminocarbonyl, mono- and di($\text{C}_{1-6}\text{-alkyl}$)aminocarbonyl, amino- $\text{C}_{1-6}\text{-alkyl-aminocarbonyl}$, mono- and di($\text{C}_{1-6}\text{-alkyl}$)amino- $\text{C}_{1-6}\text{-alkyl-aminocarbonyl}$; or R^1 and R^2 together with the nitrogen atom to which they are attached ($-\text{N}(\text{R}^1)\text{R}^2$) form an optionally substituted nitrogen-containing heterocyclic ring;

25 R^3 is selected from hydrogen, $\text{C}_{1-6}\text{-alkyl}$, and $\text{C}_{1-6}\text{-alkylcarbonyl}$, said alkyl and alkylcarbonyl optionally carrying substituent(s) selected from halogen, hydroxy, $\text{C}_{1-6}\text{-alkoxy}$, carboxy, $\text{C}_{1-6}\text{-alkoxycarbonyl}$, $\text{C}_{1-6}\text{-alkylcarbonyl}$, amino, mono- and di($\text{C}_{1-6}\text{-alkyl}$)amino, and aryl optionally substituted 1-3 times with $\text{C}_{1-4}\text{-alkyl}$, $\text{C}_{1-4}\text{-alkoxy}$, nitro, cyano, amino or halogen; or R^1 and

30 R^3 together form a biradical Z^* which is as defined for Z;

Q is an anion;

- X¹ and X² independently designate a substituent present 0-5 times on Ar¹ and Ar², respectively, each X¹ and X² independently being selected from the group consisting of optionally substituted C₁₋₁₂-alkyl, optionally substituted C₂₋₁₂-alkenyl, optionally substituted C₄₋₁₂-alkadienyl, optionally substituted C₆₋₁₂-alkatrienyl, optionally substituted C₂₋₁₂-alkynyl, hydroxy, optionally substituted C₁₋₁₂-alkoxy, optionally substituted C₂₋₁₂-alkenyloxy, carboxy, optionally substituted C₁₋₁₂-alkoxycarbonyl, optionally substituted C₁₋₁₂-alkylcarbonyl, formyl, C₁₋₆-alkylsulphonylamino, optionally substituted aryl, optionally substituted aryloxycarbonyl, optionally substituted aryloxy, optionally substituted arylcarbonyl, optionally substituted arylamino, arylsulphonylamino, optionally substituted heteroaryl, optionally substituted heteroaryloxycarbonyl, optionally substituted heteroaryloxy, optionally substituted heteroarylcarbonyl, optionally substituted heteroaryl, optionally substituted heterocyclamino, heteroarylsulphonylamino, optionally substituted heterocyclol, optionally substituted heterocyclloxycarbonyl, optionally substituted heterocycloloxy, optionally substituted heterocyclcarbonyl, optionally substituted heterocyclamino, heterocyclsulphonylamino, amino, mono- and di(C₁₋₆-alkyl)amino, carbamoyl, mono- and di(C₁₋₆-alkyl)aminocarbonyl, amino-C₁₋₆-alkyl-aminocarbonyl, mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-aminocarbonyl, C₁₋₆-alkylcarbonylamino, amino-C₁₋₆-alkyl-carbonylamino, mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-carbonylamino, cyano, guanidino, carbamido, C₁₋₆-alkanoyloxy, C₁₋₆-alkylsulphonyl, C₁₋₆-alkylsulphiny, C₁₋₆-alkylsulphonyloxy, aminosulfonyl, mono- and di(C₁₋₆-alkyl)aminosulfonyl, nitro, optionally substituted C₁₋₆-alkylthio, and halogen, where any nitrogen-bound C₁₋₆-alkyl is optionally substituted with hydroxy, C₁₋₆-alkoxy, C₂₋₆-alkenyloxy, amino, mono- and di(C₁₋₆-alkyl)amino, carboxy, C₁₋₆-alkylcarbonylamino, halogen, C₁₋₆-alkylthio, C₁₋₆-alkyl-sulphonyl-amino, or guanidino;
- and salts thereof.

2. The compound according to claim 1, wherein R¹, R² and R⁴ independently are selected from optionally substituted C₁₋₁₂-alkyl, optionally substituted C₂₋₁₂-alkenyl, optionally substituted C₂₋₁₂-alkynyl, optionally substituted C₁₋₁₂-alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, aminocarbonyl, mono- and di(C₁₋₆-alkyl)aminocarbonyl, amino-C₁₋₆-alkyl-aminocarbonyl, and mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-aminocarbonyl.
3. The compound according to any of the preceding claims, wherein R³ is selected from hydrogen and methyl.
4. The compound according to any of the preceding claims, wherein X¹ and X² independently designates 0-4 substituents, where such optional substituents independently are selected from optionally substituted C₁₋₁₂-alkyl, hydroxy, optionally substituted C₁₋₁₂-alkoxy, optionally

- substituted C₂₋₁₂-alkenyloxy, carboxy, optionally substituted C₁₋₁₂-alkylcarbonyl, formyl, C₁₋₆-alkylsulphonylamino, optionally substituted aryl, optionally substituted aryloxycarbonyl, optionally substituted aryloxy, optionally substituted arylcarbonyl, optionally substituted arylamino, arylsulphonylamino, optionally substituted heteroaryl, optionally substituted heteroarylarnino, optionally substituted heteroarylcarbonyl, optionally substituted heteroaryloxy, heteroarylsulphonylamino, optionally substituted heterocyclyl, optionally substituted heterocyclxyloxy, optionally substituted heterocyclylamino, amino, mono- and di(C₁₋₆-alkyl)amino, carbamoyl, mono- and di(C₁₋₆-alkyl)aminocarbonyl, amino-C₁₋₆-alkyl-aminocarbonyl, mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-aminocarbonyl, C₁₋₆-alkylcarbonyl, amino, amino-C₁₋₆-alkyl-carbonylamino, mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-carbonylamino, guanidino, carbamido, C₁₋₆-alkylsulphonyl, C₁₋₆-alkylsulphiny, C₁₋₆-alkylsulphonyloxy, optionally substituted C₁₋₆-alkylthio, aminosulfonyl, mono- and di(C₁₋₆-alkyl)aminosulfonyl, and halogen, where any nitrogen-bound C₁₋₆-alkyl may be substituted with a substituent selected from the group consisting of hydroxy, C₁₋₆-alkoxy, and halogen.
5. The compound according to any of the preceding claims, wherein R¹, R² and R⁴ independently are selected from optionally substituted C₁₋₆-alkyl, optionally substituted C₁₋₆-alkylcarbonyl, heteroarylcarbonyl, aminocarbonyl, mono- and di(C₁₋₆-alkyl)aminocarbonyl, amino-C₁₋₆-alkyl-aminocarbonyl, and mono- and di(C₁₋₆-alkyl)amino-C₁₋₆-alkyl-aminocarbonyl.
15. 6. The compound according to any of the preceding claims, wherein X¹ and X² independently designate 0-3 substituents, such optional substituents independently being selected from optionally substituted C₁₋₆-alkyl, hydroxy, optionally substituted C₁₋₆-alkoxy, carboxy, optionally substituted C₁₋₆-alkylcarbonyl, C₁₋₆-alkylsulphonylamino, optionally substituted aryl, optionally substituted aryloxy, optionally substituted arylamino, arylsulphonylamino, optionally substituted heteroaryl, optionally substituted heteroarylarnino, heteroarylsulphonylamino, amino, mono- and di(C₁₋₆-alkyl)amino, carbamoyl, C₁₋₆-alkyl-carbonylamino, guanidino, carbamido, optionally substituted C₁₋₆-alkylthio, optionally substituted heterocyclyl, optionally substituted heterocyclxyloxy, optionally substituted heterocyclylamino and halogen, where any nitrogen-bound C₁₋₆-alkyl may be substituted with a substituent selected from the group consisting of hydroxy, C₁₋₆-alkoxy, and halogen.
20. 7. The compound according to any of the preceding claims, wherein V designates -CH=CH-.
25. 8. The compound according to any of the preceding claims, wherein at least one of Ar¹ and Ar² is phenyl.
30. 9. The compound according to claim 8, wherein both of Ar¹ and Ar² are phenyl, m is 1 or 2, and p is 0, 1 or 2.

10. The compound according to any of the preceding claims, wherein X² represents at least one substituent selected from C₁₋₆-alkyl, C₁₋₆-alkoxy, C₁₋₆-alkylcarbonyl, optionally substituted aryl, optionally substituted aryloxy, optionally substituted arylamino, optionally substituted heteroaryl, optionally substituted heteroarylamino, mono- and di(C₁₋₆-alkyl)amino, C₁₋₆-alkyl-

5 carbonylamino, optionally substituted C₁₋₆-alkylthio, optionally substituted heterocyclyl, optionally substituted heterocyclyloxy, optionally substituted heterocyclamino and halogen.

11. The compound according to any of the preceding claims, wherein X² represents at least two halogen atoms.

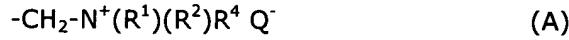
12. The compound according to any of claims 1-8 and 10-11, wherein at least one of Ar¹ and

10 Ar² is selected from the group consisting of thiazolyl, pyrrolyl, imidazolyl, pyrazolyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, thienyl, quinolyl, isoquinolyl, and indolyl.

13. The compound according to any of the preceding claims, wherein Z is -(CH₂)_n-, wherein n is 1-4.

14. The compound according to any of the preceding claims, wherein one of Y¹ and Y²

15 represents a substituent of the formula A



wherein R¹, R² and R⁴ are independently C₁₋₆-alkyl.

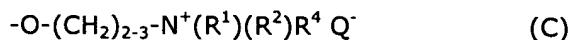
15. The compound according to any of claims 13-14, wherein Y¹ represents a substituent of the formula -CH₂-N⁺(R¹)(R²)R⁴ Q⁻.

20 16. The compound according to any of the preceding claims, wherein one of Y¹ and Y² represents a substituent of the formula B



wherein R³ is selected from hydrogen and methyl, and R¹, R² and R⁴ are independently C₁₋₆-alkyl.

25 17. The compound according to any of the preceding claims, wherein one of Y¹ and Y² represents a substituent of the formula C



wherein R¹, R² and R⁴ are independently C₁₋₆-alkyl.

18. The compound according to any of claims 14-17, wherein V is -CH=CH-, and Ar¹ and Ar² both are phenyl.

19. The compound according to claim 1, which is selected from the group consisting of:

(2-{3-[3-(2-Chloro-4-methoxy-phenyl)-3-oxo-propenyl]-3',5'-dimethyl-biphenyl-4-yloxy}-

5 ethyl)-trimethyl-ammonium, iodide;

(2-{3-[3-(4-Amino-phenyl)-3-oxo-propenyl]-3',5'-dimethyl-biphenyl-4-yloxy}-ethyl)-trimethyl-ammonium, iodide;

(2-{3-[3-(2-Amino-phenyl)-3-oxo-propenyl]-3',5'-dimethyl-biphenyl-4-yloxy}-ethyl)-trimethyl-ammonium, iodide;

10 4-{3-[3-(2-Fluoro-4-methoxy-phenyl)-3-oxo-propenyl]-2'-methoxy-biphenyl-4-yl}-1,1-dimethyl-piperazin-1-i um, iodide;

{3-[3-(4-Dibutylamino-phenyl)-acryloyl]-benzyl}-trimethyl-ammonium, iodide;

3-[4-(2-Trimethylammonium-ethoxy)-biphenyl-3-yl]-1-(3-trimethylammonium-phenyl)-propenone, di-iodide; and

15 3-[4-(2-trimethylammonium-ethoxy)-3',5'-dimethyl-biphenyl-3-yl]-1-(2-trimethylammonium-4-methoxy-phenyl)-propenone, di-iodide.

20. A pharmaceutical composition comprising a compound as defined in any of the claims 1-19 in combination with a pharmaceutically acceptable carrier.

21. A compound as defined in any of the claims 1-19 for use as a drug substance.

20 22. Use of a compound as defined in any of the claims 1-19, for the preparation of a pharmaceutical composition for the treatment of bacterial infections.

23. The use according to claim 22, wherein the bacterial infection is associated with bacteria selected from the group consisting of Gram-positive bacteria, Gram-negative bacteria, microaerophilic bacteria and anaerobic bacteria.

25 24. The use according to claim 23, wherein the bacteria is a microaerophilic bacteria associated with gastric disease, such as *Helicobacter pylori*.

25. The use according to claim 23, wherein the bacteria is selected from antibiotic-sensitive and -resistant strains of *S.aureus*.

30 26. The use according to claim 23, wherein the bacteria is selected from antibiotic-sensitive and -resistant strains of *E.faecium*.

27. The use according to claim 23, wherein the bacteria is selected from a *S.pneumoniae* and *S.pyogenes*.

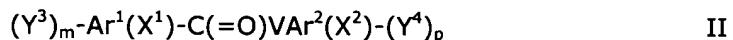
28. The use according to claim 23, wherein the bacteria is a member of *Enterobacteriaceae*, e.g. *E.coli*.

- 5 29. The use according to claim 23, wherein the bacteria is a pathogenic anaerobic bacteria,
such as *Bacteroides fragilis* or *Clostridium species*.

30. A method for the preparation of a compound of the general formula I as defined in any of claims 1-19 wherein V is $-\text{CH}=\text{CH}-$, comprising the steps

- (a) combining a ketone derivative of formula $(Y^3)_m-Ar_1(X^1).C(=O)-CH_3$ with an aldehyde

- 10 derivative of formula $\text{HCO-Ar}^2(\text{X}^2)-(\text{Y}^4)$, so as to form a mixture, whereby a compound of the general formula II



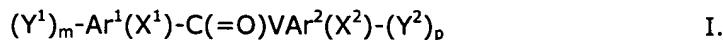
wherein Ar¹, Ar², X¹, X², V, m and p are as defined in claim 1, and wherein each Y³ and Y⁴ independently represents a substituent selected from A', B', and C'

- 15 -Z-N(R¹)R², (A')
 -NR³-Z-N(R¹)R², and (B')
 -O-Z-N(R¹)R²; (C')

wherein Z, R¹, R² and R³ are as defined in claim 1;

is obtained; and

- 20 (b) treating the compound of the general formula II with an alkylating agent or an acylating agent so as to obtain the compound of the general formula I



31. A method for treating bacterial infections in a mammal comprising administration of a compound as defined in any of claims 1-19.

- 25 32. The method according to claim 31, wherein the bacterial infection is associated with
bacteria selected from Gram-positive bacteria, Gram-negative bacteria, microaerophilic
bacteria and anaerobic bacteria.

33. The method according to claim 32, wherein the bacteria is a microaerophilic bacteria, associated with gastric disease, such as *Helicobacter pylori*.
34. The method according to claim 32, wherein the bacteria is selected from antibiotic-sensitive and -resistant strains of *S.aureus*.
- 5 35. The method according to claim 32, wherein the bacteria is selected from antibiotic-sensitive and -resistant strains of *E.faecium*.
36. The method according to claim 32, wherein the bacteria is selected from *S.pneumoniae* and *S.pyogenes*.
- 10 37. The method according to claim 32, wherein the bacteria is a member of *Enterobacteriaceae*, e.g. *E.coli*.
38. The method according to claim 32, wherein the bacteria is a pathogenic anaerobic bacteria, such as *Bacteroides fragilis* or *Clostridium species*.